APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,931	11/25/2003	Karl Barth	P03,0464	8344

26574   7590   05/30/2007

SCHIFF HARDIN, LLP
PATENT DEPARTMENT
6600 SEARS TOWER
CHICAGO, IL 60606-6473

EXAMINER
LIEW, ALEX KOK SOON

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
05/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/721,931	BARTH ET AL.
	Examiner	Art Unit	
	Alex Liew	2624	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>25 November 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-6</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-6</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>25 November 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Double Patenting

1.   The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2.   Claim 1 is provisionally rejected under the judicially created doctrine of

obviousness-type double patenting as being unpatentable over claim 8 of copending

Application No 10/721,936 in view of Herrington (IEEE pub titled: "Image Processing

and Display of 3D intra-Coronary Ultrasound Images").

Application No 10/721,936 discloses a method to produce a volume data set,

comprising

● segmenting an imaged surface of a subject imaged in a first volume data set (see

claim 1 of copending application, lines 7 – 8),

- transforming the first volume data set by filtering the second volume set, causing

  the segmented imaged surface and its environment to be transformed into a

  plane (see claim 1 of co-pending application, lines 9 – 12) and

- filtering for an image enhancement selected from the group consisting of

  smoothing, edge-accentuation and structure-accentuation (see claim 8 of

  copending application).

The co-pending application does not disclose a third volume data by filtering the second

volume data set such that structures of not interest of the subject.

Herrington discloses a third volume data by filtering the second volume data set such .

that structures of not interest of the subject, imaged in the second volume data set, are

filtered out based on features associated in general with structures of no interest (see

figure 3 – the structure that is not of interest is outside the darker circular area) and

based on expected distance from the surface of the structure of no interest such that

structures of interest of the subject (see figure 3 – shows a radial filter where the filter

detects circular structure boundaries based on radial distance), imaged in the second

volume data set, remain based on feature associated with structures of interest (see

figure 2 and the paragraph above it – the Gaussian filter enhances echogenic

interfaces, which is the structure of interest) and based on the expected from the

surface of the structures of no interest. One skill in the art would include filtering out

structures of no interest based on expected distance because some structure being

imaged such as the a human bone have circular cross sectional patterns, where a radial

filter would be best to detect such object or if there are disease present on the bone, to

improve image recognition so doctor may locate disease or other deviation easier.

3.   Claim 2 is provisionally rejected under the judicially created doctrine of

obviousness-type double patenting as being unpatentable over claim 4 of copending

Application No 10/721,936 in view of Herrington (IEEE pub titled: "Image Processing

and Display of 3D intra-Coronary Ultrasound Images").

Copending application further discloses the first volume data set as a number of

successive computed tomographic slice images, with image data slice image described

with Cartesian coordinates (see copending application claim 4 lines 1 – 4) and

comprising, for segmenting the imaged body surface

performing a coordinate transformation for a slice image to polar coordinates with

regards to a straight line that proceeds through the imaged subject and that is aligned

substantially at a right angle to the individual slice images (see copending application

claim 4 lines 6 – 8), determining contours that are imaged in each transformed sliced

image and that are associated with the imaged surface (see copending application

claim 4 lines 9 – 11), transforming the image points of the determined contours back

into the coordinate system associated with the first volume data set (see copending

application claim 4 lines 11 – 12) and re-extracting image points along the contours for

representing the surface of the imaged first subject transformed according to a plane for

generating a second dataset (see copending application claim 4 lines 13 – 15).

The co-pending application does not disclose a third volume data by filtering the second

volume data set such that structures of not interest of the subject.

Herrington discloses a third volume data by filtering the second volume data set such

that structures of not interest of the subject, imaged in the second volume data set, are

filtered out based on features associated in general with structures of no interest (see

figure 3 – the structure that is not of interest is outside the darker circular area) and

based on expected distance from the surface of the structure of no interest such that

structures of interest of the subject (see figure 3 – shows a radial filter where the filter

detects circular structure boundaries based on radial distance), imaged in the second

volume data set, remain based on feature associated with structures of interest (see

figure 2 and the paragraph above it – the Gaussian filter enhances echogenic

interfaces, which is the structure of interest) and based on the expected from the

surface of the structures of no interest. One skill in the art would include filtering out

structures of no interest based on expected distance because some structure being

imaged such as the a human bone have circular cross sectional patterns, where a radial

filter would be best to detect such object or if there are disease present on the bone, to

improve image recognition so doctor may locate disease or other deviation easier.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1 – 3 are rejected under U.S.C. 103(a) as being unpatentable over Crook

(US pat no 5,452,407) in view of Herrington (IEEE pub "Image Processing and Display

of 3D Intra-Coronary Ultrasound Images").

With regards to claim 1, Crook discloses a method to produce a volume data set,

comprising

- segmenting an imaged surface of a subject imaged in a first volume data set (see

  figure 5 as the first volume data set),

- transforming the first volume data set by filtering the second volume set, causing

  the segmented imaged surface and its environment to be transformed into a

  plane (the grids of figure 6 is the second data set) and

- producing a third volume data by filtering the second volume data set such that

  structures of not interest of the subject, imaged in the second volume data set,

  are filtered out based on features associated in general with structures of no

  interest and such that structures of interest of the subject, imaged in the second

  volume data set, remain based on feature associated with structures of interest

  and based on the expected from the surface of the structures of no interest (see

  column 7 lines 39 – 43 – only those desired are examine).

Crook does not disclose filtering out structures of no interest based on expected

distance from the surface of the structure of no interest. Herrington discloses filtering

out structures of no interest based on expected distance from the surface of the

structure of no interest (see figure 3 – shows a radial filter where the filter detects

circular structure boundaries based on radial distance). One skill in the art would include

filtering out structures of no interest based on expected distance because some

structure being imaged such as the a human bone have circular cross sectional

patterns, where a radial filter would be best to detect such object or if there are disease

present on the bone, to improve image recognition so doctor may locate disease or

other deviation easier.

With regards to claim 2, Crook discloses a method of claim 1, wherein the subject is a

first subject and wherein at least one imaged second subject is disposed outside of the

first subject (see figure 6 – shows a human bone) and comprising filtering out the

imaged second subject from the second volume data set with the non-interesting

structures (see column 7 lines 39 – 43).

With regards to claim 3, an extension to the arguments to claim 1, Herrington discloses

filtering the second volume set by edge-sensitive with at least one of the structures of

no interest and the structures of interest (see figure 3 and paragraph above figure 3 –

shows a radial edge detector where it detest circular edges such as a human bone).

3.   Claims 4 – 6 are rejected under U.S.C. 103(a) as being unpatentable over Crook

('407) in view of Herrington as applied to claim 1 further in view of Essinger (US pat no

4,939,646).

With regards to claim 4, Crook and Herrington disclose all the limitations discussed in claim 1 including the first volume data set as a number of successive computed tomographic slice images, with image data slice image described with Cartesian coordinates (see figure 6), but do not disclose converting image data slice from Cartesian coordinate to polar coordinate. Essinger discloses performing a coordinate transformation for a slice image to polar coordinates with regards to a straight line that proceeds through the imaged subject and that is aligned substantially at a right angle to the individual slice images (see figure 4 – 43 – the coordinate system of image in figure 3 is being convert to polar coordinate system, the image in figure 3 is a slice image of a three-dimensional object of a human), determining contours that are imaged in each transformed sliced image and that are associated with the imaged surface (see figure 4 – 44 – the coefficients that are calculate are depends on the value points in the image slice in figure 3) and transforming the image points of the determined contours back into the coordinate system associated with the first volume data set (see figure 4 – 46). Crook discloses extracting image points along the contours for representing the surface of the imaged first subject transformed according to a plane for generating a second dataset (see figure 7b) and one would include re-extracting step because to display the results of the transformed coefficient, shown in Essinger figure 4 – 46. One skill in the art would include step of converting the image slices coordinate system from Cartesian to polar because to help detect radial edges on the image slice to find any unusual features present such as cancer, to improve recognition process.

With regards to claim 5, an extension to the arguments to the rejection of claim 4, Essinger discloses a fourth volume data set in which the image points of the third volume data set are transformed back into the coordinate system associated with the first volume data set (see figure 4 – 46).

With regards to claim 6, an extension to the arguments to the rejection of claim 4, Essinger discloses displaying an image associated with the fourth volume data set by volume rendering (see figure 4 – 46).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Liew whose telephone number is (571)272-8623. The examiner can normally be reached on 9:30AM - 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

   Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alex Liew
AU2624
5/28/07